Guidelines for Pediatric Inter-facility Transport Program

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Guidelines for Pediatric Inter-facility Transport Program

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GUIDELINES FOR PEDIATRIC INTERFACILITY TRANSPORT PROGRAMS IN CALIFORNIA

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Introduction

Safe and effective emergency transport of pediatric patients between health care facilities and specialized pediatric centers (e.g. Pediatric Critical Care Centers, Pediatric Trauma Centers, and Trauma Centers) is an essential component of organized systems of care for critically ill and injured children. Assuring access and appropriate linkage to such specialized centers should be part of local and regional EMS for Children (EMSC) programs.

Specialized centers for neonatal and pediatric emergency and critical care developed rapidly in the early 1990's in California. Neonates and critically ill and injured children are being transported from community health facilities, including emergency departments, to centers with specialized pediatric personnel and services. Prompt referral of such patients has been shown to improve outcomes. Specialized interfacilty transport programs have also evolved to improve access to these centers and to facilitate earlier delivery of specialized critical care services. Ideally all pediatric interfacility transports should occur rapidly and safely by qualified interfacility pediatric transport programs functioning with prospectively developed operational guidelines, consultation agreements and transfer agreements.

The purpose of this publication is to provide uniform guidelines within the state for pediatric interfacility transport programs to assure quality of care, cost efficiency, coordination of transports, and adherence to state and federal regulations.

In 1986, a statewide California Pediatric Critical Care Coalition was formed to develop recommendations for improving services for critically ill and injured children. A committee of the Coalition developed recommendations for pediatric interfacility transport services. This committee of the Coalition was composed of members of the Advisory Committee of the Northern California Perinatal Dispatch Center, the Pediatric Intensive Care Networks of Northern and Central California and the Ad hoc Committee on Pediatric Interfacility Transport Services in California. In 1992 representatives of the Coalition's committee were appointed to the Pediatric Interfacility Transport Program Subcommittee of the California EMSC Project, who developed the first State guidelines. This publication is a revision of the original guidelines to reflect current practice. Earlier drafts of these guidelines were used in the development of Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients published by the American Academy of Pediatrics.

Pediatric interfacility transport programs, like other components of pediatric emergency and critical care systems, must be tailored to the special needs and resources of each region. These guidelines are intended to apply to both hospital-based and non-hospital based programs that *regularly* provide pediatric interfacility transport services.

Prehospital care providers are currently involved in the interfacility transport of pediatric patients. If such transport services are rendered routinely, as part of a prehospital care Provider's service plan or contract, it is recommended the provider follow these guidelines. Determination of the level of capability of the transporting service, whether an ambulance provider or an organized pediatric interfacility transport program, is the responsibility of both the transferring and receiving physicians. When ambulance providers predominantly involved in prehospital care conduct pediatric interfacility transfers, the appropriateness of such transports and quality of care provided should be reviewed and monitored by the local EMS agency in concert with pre-hospital care providers. This review should be included in LEMSAs and provider agencies QI plan.

GUIDELINES FOR PEDIATRIC INTERFACILITY TRANSPORT PROGRAMS IN CALIFORNIA

I. DEFINITIONS:

Ambulance Provider. Provider of air or ground ambulances.

Emergency Medical Technician (Title 22, Division 9, Chapter 2) or “EMT-I” or “EMT-Basic” means a person who has successfully completed an EMT-I course which meets the requirements of this Chapter, has passed all required tests, and who has been certified by the EMT-I certifying authority.

Emergency Medical Technician-Paramedic (Title 22, Division 9, Chapter 4) or "EMT-P" or "paramedic" or "mobile intensive care paramedic" means an individual who is educated and trained in all elements of prehospital advanced life support; whose scope of practice to provide advanced life support in accordance with the standards prescribed by this Chapter, and who has a valid licensed issued pursuant to this Chapter.

Local EMS Agency (LEMSA). “Local EMS agency” means the agency, department, or office having primary responsibility for administration of emergency medical services in a county which is designated pursuant to Chapter 4 ((commencing with Section 1797.200) H&S Code, Division 2.5).

Medical Control Physician. The physician who is responsible for directing the medical care of the patient during transport which includes standing field treatment protocols.

Pediatric. The term "pediatric" includes neonates, infants, children and adolescents. For data collection purposes pediatric is defined as less than 15 years (as per California Children Services) of age. Some facilities may extend the pediatric age to 21 years old.

Pediatric Interfacility Transport. The transport of ill or injured pediatric patients between health care facilities.

Pediatric Interfacility Transport Program. A transport program organized to provide pediatric interfacility transport on a regular basis. This program may be hospital-based or non-hospital-based.

Prehospital Care Providers. An EMS provider approved by the Local EMS Agency.

Qualified Specialist. (Title 22, Division 9, Chapter 7) “Qualified Specialist” or “qualified surgical specialist” or “qualified non-surgical specialist: means a

physician licensed in California who is board certified in a specialty by the American Board of Medical Specialties, the Advisory Board for Osteopathic Specialties, a Canadian board of other appropriate foreign specialty board as determined by the American Board of Medical Specialties for that specialty.

(a) A non-board certified physician may be recognized as a "qualified specialist" by the local EMS agency upon substantiation of need by a trauma center if:
    (1) the physician can demonstrate to the appropriate hospital body and the hospital is able to document that he/she has met requirements which are equivalent to those of the Accreditation council for Graduate Medical Education (ACGME) or the Royal college of Physicians and Surgeons of Canada;
    (2) the physician can clearly demonstrate to the appropriate hospital body that he/she has substantial education, training, and experience in treating and managing trauma patients which shall be tracked by the trauma quality improvement program; and
    (3) the physician has successfully completed a residency program.

Regional Interfacility Pediatric Transport Program. An organized program that provides pediatric transport services for multiple facilities in a geographic area.

Referring Physician. The physician at the sending facility

Transport Team. A medical team composed of a minimum of two healthcare professionals responsible for providing clinical care and monitoring for a patient during transport**.**

Transport Team Nurse. A registered nurse providing clinical care for a patient during transport, within the scope of the licensure and training.

Transport Team Physician. The physician providing clinical care for a patient during transport.

Transport Team Respiratory Therapist. A respiratory therapist or a respiratory care practitioner providing clinical care for a patient during transport within the scope of licensure and training.

II. STRUCTURE

A. Any transport program should have, at minimum, the components listed in this guideline included in their systems.

1. Organization and Personnel

2. Operational Agreement with Ambulance Providers

3. Affiliated Hospital Agreement

4. Continuous Quality Improvement Program

5. Information Management

6. Pediatric Interfaciity Transport Equipment and Supplies

III. ORGANIZATION AND PERSONNEL

Any transport program should have sufficient personnel, staff and resources to facilitate and provide appropriate support of all aspects of the transport program, including but not limited to:

A. Administrative Director of Pediatric Interfacility Transport Program

1. Qualifications

a. Training and experience in transport administration.

2. Responsibilities

a. Oversight of structure, administration, operational components, fiscal management, information management and a quality improvement mechanism for the pediatric transport program.
b. Assurance that the transport program and personnel meet all applicable, federal, state and local laws, regulations, and Licensure.
c. Implement and develop safety programs in conjunction with the Medical Director
d. Provides for continuing education to maintain and enhance necessary skills in conjunction with the medical director.
e. Notification of transport team members about insurance coverage and medicolegal implications of being transport team

members.

f. Shall establish a liaison with Local EMS Agencies (LEMSAs) and other involved public and private agencies.

B. Medical Director

1. Qualifications

a. Completion of specialized training, experience, or expertise in pediatric transport medicine.
b. Qualified specialist in pediatric emergency medicine, pediatric critical care, neonatal, or emergency medicine.
c. If the medical director does not meet the requirements of 1(b) then there must be an associate medical director with these qualifications.

2. Responsibilities

a. Concurrent service as administrative director if individual meets qualifications in II A(1) and B(1).
b. Authority over transport utilization.
c. Coordination of specialists and services required in the transport of patients.

d. Establishment of guidelines for transport team composition and mode of transportation.
e. Appointment and assurance of competence of medical control physicians and transport team physicians and the development of appropriate orientation, training, and continuing education programs for these physicians.
f. Appointment of associate medical director(s) as necessary.
   (1) The associate medical director(s) should have specialized training, experience and expertise in pediatric transport and pediatric critical care, including advanced skills in monitoring and life support techniques.
   (2) When a medical director is unavailable an associate medical director should be designated to function as medical director.

C. Transport Team Coordinator

1. Qualifications

a. Registered nurse, respiratory therapist, paramedic, or physician
b. At least 2 years of clinical experience in pediatric transport.
c. Advanced skills and knowledge of the standards of practice in

pediatric monitoring and life support techniques. The determination of what specific training (i.e., PALS, PEPP, PHTLS, etc) is to be made by the medical director.

d. A minimum of 3 years of clinical experience in pediatric critical care, neonatal intensive care or pediatric emergency services.

2. Responsibilities

a. Concurrent service as the administrative director if individual meets qualifications on IIA (1) and IIC (1).
b. Appointment and assurance of competence of transport team members and development of appropriate orientation, training and continuing education programs.

D. Joint Responsibilities of the Administrative and Medical Directors

1. Collaborative responsibilities of the administrative and medical directors include, but are not limited to, the following:

a. Implementation of these guidelines for the pediatric interfacility transport program.
b. Development, implementation and annual review of policies, protocols, and standards for the transport program including policies and procedures for patient care.
c. Collection and analysis of data necessary for evaluation of the safety and effectiveness of the transport program.
d. Integration of orientation, training and continuing education programs for personnel involved in the transport program.
e. Selection and periodic evaluation of competency and performance of personnel involved in the transport program.
f. Implementation of an organized quality improvement program, including the review of quality of care provided by the transport program and appropriate utilization of the transport program and its resources.
g. Development of the budget.
h. Appropriate interface with the local EMS agency.
i. Development of outreach education related to the pediatric interfacility transport program.

E. Medical Control Physician

1. Qualifications

a. Qualified specialist in at least one of the following: pediatrics, pediatric emergency medicine, emergency medicine, pediatric anesthesiology or pediatric critical care,

b. Two years of clinical experience in pediatric transport

2. Responsibilities

a. Oversight of medical care delivered during individual transports.
b. Attendance at regular meetings of the transport program staff.
c. When on call is readily available for consultations and communication with transport team and referral sources.
d. Verification of acceptance and disposition of the patient.
e. Determination of the transport team composition, the mode of transport and direction of the clinical care for an individual transport
f. Delegation of specific responsibilities for the medical care of an individual patient to another physician who has special training in the medical care required; however, the medical control physician retains overall medical responsibility for the transport.

F. Transport Team Personnel

1. Qualifications

a. A combination of at least two of the following personnel: Physician, registered nurse, respiratory care practitioner, EMT, EMT or paramedic as determined by the medical control physician.
. b. Training and experience in pediatric transport and pediatric or neonatal critical care as determined by the medical director.
c. Transport team personnel who are responsible for the stabilization and transport of ill or injured pediatric patients should collectively possess the skills and knowledge within their scope of practice to provide a level of care commensurate with the specific and anticipated clinical needs of the patient, as determined by the referring physician in collaboration with the medical control physician.

2. Responsibilities

a. Stabilization and care during transport of ill or injured pediatric patients.
b. The transport team leader should:

(1) Be assigned by the medical control physician for each

transport team.
(2) Be responsible for patient care under the direction of the medical control physician.
(3) Coordinate, supervise and/or participate in the patient care delivered.
(4) Maintain communications with the medical control physician and the receiving and referring health care personnel.
(5) Be responsible for obtaining consents required for the transport and for admission to the receiving hospital.
(6) Attend formal orientation and education programs as required by the transport program.
(7) Mobilize the transport team as soon as possible.

G. Communication Center

1. The Pediatric Interfacility Transport Program should have a transport communication center or special location where transport requests are received and processed. The essential components are:

a. Communication and dispatch protocols
b. Dedicated telecommunication capability between all components of the transport program.

c. A reference data base on hospitals and ambulance providers; and
d. Policy for Document Action Requirements for all transport referrals.

2. Communication personnel should be trained and skilled in the expeditious handling of transport referrals.
3. All communications for individual transports should be documented.
4. A reference data base should be maintained and should include regional information pertinent to pediatric interfacility transport, including hospitals, ambulance providers, airports, interfacility distances, interfacility transport times by the various ambulance providers, and other essential information stored in a manner which allows immediate accessibility.
5. The transport program should provide a communications system that facilitates communications between the transport team, the communication center personnel, the medical control physician, and the referring and receiving facilities.

IV. OPERATIONAL AGREEMENTS WITH AMBULANCE PROVIDERS

Pediatric Interfacility Transport Programs should have written operational agreements with ground and air ambulance providers used by the program for emergency and/or non-emergency transports.

A. Agreements should include but not be limited to:

1. Responsibilities for patient care
2. Process for recording and transferring appropriate information and records
3. Financial and indemnification provisions
4. Response time standards
5. Term of agreement

V. AFFILIATED HOSPITAL AGREEMENTS

A. Pediatric Interfacility Transport Programs should have written agreements with referring and receiving hospitals that routinely utilize the program.

B. Agreements should specify the roles and responsibilities of the transport program and the hospitals including:

1. Agreement to transfer and receive appropriate pediatric patients when indicated.
2. Policies and procedures for evaluating, transferring or receiving pediatric patients.
3. Responsibilities for patient care before, during, and after transport.
4. Private physician and family involvement.
5. Recording and transferring appropriate information and records.
6. Financial and indemnification provisions.
7. Term of agreement.

C. Agreements should include provisions for educational programs related to pediatric transport, evaluation and stabilization of critically ill and injured pediatric patients, and availability of pediatric critical care consultation and other pediatric critical care services.

VI. CONTINUOUS QUALITY IMPROVEMENT PROGRAM

Pediatric Interfacility Transport Program should have an organized multidisciplinary quality improvement program including participation from the facilitates, prehospital providers, physicians, etc. This quality improvement program will at minimum:

1. Establish, maintain, support and document evidence of a planned, systematic quality improvement program.

2. Assure appropriate and adequate response to findings from quality improvement activities, including the identification of opportunities to improve patient care and pediatric transport program.
3. Assure appropriate and efficient use of the transport programs and resources.
4. Utilize concurrent review, generic screens and focused studies to monitor pediatric care provided by the Pediatric Interfacility Transport Program.

A. The quality improvement program should address the following:

1. Safety
   a. Patient safety
   b. Transport team safety
   c. Equipment safety, including records of equipment used, maintenance, testing of function, and critical failures
   d. Untoward events

2. Expediency
   a. Recording and review of response times for each component of the transport program.

3. Resource allocation and cost-effectiveness
   a. Monitoring and review of appropriate utilization of the transport program, transport personnel, equipment, supplies, and mode of transport
   b. Monitoring and review of transport costs and cost-effectiveness.

4. Triage
   a. Evaluation of the flow of information, prioritization of resource allocation, selection of ambulance provider, and selection of receiving facility.

5. Patient Care and Management
   a. Evaluation of patient care and management in terms of patient outcome.

B. Components of the plan should include an interface with the prehospital provider, local EMS agency, emergency department, trauma services, inpatient pediatric services, and pediatric critical care quality improvement activities.

VII. INFORMATION MANAGEMENT

Accurate and current records should be maintained on all components of

thePediatric Interfacility Transport Program.

A As available, centralized data centers should receive data from each transport program.

B Data should be collected and reviewed on a regular basis for planning, evaluation and quality improvement.

C. Programs should cooperate in the development, analysis and distribution of data.

VIII. PEDIATRIC INTERFACILITY TRANSPORT EQUIPMENT AND SUPPLIES

All interfacility transport units should have equipment and supplies in accordance with the local EMS agency (LEMSA) and State policies.

A. The following equipment and supplies should be available and maintained in proper operating condition for use by the Pediatric Interfacility Transport Program.

1. Transport gurney/isolette should:
   a. be capable of providing a neutral thermal environment and should allow for continuous intensive care at all times.
   b. be capable of being loaded into an ambulance by the ambulance personnel and safely secured within the ambulance.
   c. utilize child passenger restraints systems, (e.g. car seats) as medically appropriate and commercially available.

2. Portable patient equipment
   a. Portable patient monitoring equipment should be capable of monitoring the patient in a moving environment (see Appendix A).
   b. Transport equipment should have independent battery power capability of twice the expected transport time.

3. Transport oxygen/air systems
   a. The primary transport oxygen/air system should have the capability of blending air and oxygen and providing a precise oxygen concentration from 21% to 100% at the discretion of medical control.
   b. Oxygen/air systems should have the capability to operate for twice the anticipated duration of the transport as estimated by the transport program.
   c. The transport equipment should be capable of direct connection to ambulance oxygen/air and power supplies to include:

(1) 50 Pounds Per Square Inch (PSI) oxygen/air source.
(2) Oxygen and air connections.
(3) oxygen/air flow meters capable of delivery of up to 15 liters/minute.

4. Ambulance Power
   a. Inverter adequate to power the transport equipment.
   b. Built-in suction.

5. All transport equipment and supplies should be checked and secured such that it will maintain physical and functional integrity when subjected to an impact or deceleration.

B. Operation and Maintenance

1. All medical equipment and supplies should meet applicable federal and state requirements, including Federal Aviation Administration if transport vehicle is an aircraft, hazardous material regulations.
2. All equipment should be maintained in working order and be ready for use on transport.

C. Other Equipment

Specialty equipment as determined by the provider to care for patients being transported.

APPENDIX A
(ATTACHMENT)

The following equipment, medication and supplies should be stocked and readily available for transport. Selection for the individual transport should be based on the patient's needs as determined by the medical control physician and the referring physician. Additional equipment, medications and supplies may be needed for certain specialized pediatric transports. All equipment and supplies must be appropriately sized for pediatrics.

a. Monitoring Equipment

1. Stethoscope
2. Cardiac-respiratory monitor
3. Invasive pressure monitors, able to monitor at least 2 channels
4. Blood pressure cuffs (automatic and manual) neonatal, infant, child, and adult
5. ECG monitor/defibrillator (5-360 Joules capacity, or biphasic equivalent) with pediatric and adult sized paddles.
6. Pulse oximeter
7. Continuous End Tidal CO_2
8. Inspired oxygen concentration (FiO_2) monitor
9. Patient thermometer/probes able to measure core temperatures.
10. Point of care device: minimum blood glucose. Prefer point of care blood gas and electrolytes analysis

b. Respiratory Equipment

1. Oxygen delivery (50 psi with alarm system)
2. Flowmeter -15 L/minute
3. Portable air and oxygen cylinders
4. Oxygen delivery devices (i.e. nasal cannulas and oxygen facemasks, infant, pediatric and adult sizes)
5. Suction devices:
    a) Bulb syringe
    b) Stand alone battery powered suction unit
6. Suction catheters (tracheal and pharyngeal) (infant, child, adult sizes)
7. Nebulizer
8. Oral airways (0-5)
9. Nasopharyngeal airways (infant, child, adult)
10. Bag valve mask (BVM) device, self inflating (neonatal / pediatric size 500 ml and adult size 1000 ml).
11. Clear face masks for BVM (infant, child, and adult sizes)
12. Laryngoscope and blades (curved 2, 3, 4; straight 0, 1, 2, 3, 4), spare light bulbs and batteries

13. Endotracheal tubes (uncuffed 2.5-5.0 and cuffed 3.0-8.0)
14. Endotracheal tube Stylettes (pediatric and adult)
    Magill forceps (pediatric and adult)
15. Transport mechanical ventilator capable of delivering pressure-control breaths and measuring tidal volumes from 50 ml-750 ml, inspiratory times as low as 0.3 seconds, flows as low as 5 liters/minute, rates up to 60 breaths/minute, PEEP up to 20 cm H_2O. Inspired gas should be humidified.
16. Chest tubes, placement equipment and Heimlich Valve
17. Naso/orogastric tubes (infant, child, adult sizes)

c. Vascular Access

1. Peripheral Intravenous (PIV) catheters from 24 Gauge through 14 Gauge
2. IV tubing
3. Intraosseous access device or needles
4. Central lines 3, 4, 5, and 7 French (optional)
5. Umbilical Arterial Catheter (UAC), Umbilical Venous Catheter (UVC), placement and monitoring equipment
6. Infusion pump(s) – prefer "Smart Pump" technology

d. Other Equipment

1. Adhesive tape
2. Urinary bladder catheters (infant, child, adult sizes)
3. Blood culture and laboratory specimen tubes (optional)
4. Penlight/flashlight
5. Warming devices, insulated blanket
6. Cooling devices
7. Pediatric backboard
8. Cervical collars
9. Lower extremity traction devices

e. Resource materials

1. Length or weight-based drug dosing tool
2. Length or weight-based equipment sizing tool
3. Pediatric pain assessment tool
4. Treatment protocol handbook

f. Medications

The following is a list of suggested medications; additional medications may be needed for certain pediatric transports. Drug doses should minimize the amount of calculations and preferably be determined by a weight-length based tool such as a color coded tape.

Cardiovascular Medications

- Epinephrine 1:1000 (0.1 mg/ml) and 1:10 000 (1 mg/ml)
- Adenosine
- Amiodarone
- Lidocaine hydrochloride
- Atropine

Vasopressors

- Dopamine
- Dobutamine

Respiratory medications

- Albuterol sulfate nebulizer solution
- Ipratropium Bromide nebulizer solution
- Racemic Epinephrine nebulizer solution (may use l-Epinephrine)
- Magnesium Sulfate (IV)

Anaphylaxis medications

- Diphenhydramine Hydrochloride
- Glucocorticosteroid (solumedrol or Decadron)
- Preloaded Epinephrine syringes

Analgesics and sedatives

- Opiates (Morphine, Fentanyl)
- Midazolam or Diazepam

Anticonvulsants

- Phenytoin sodium or Fosphenytoin sodium
- Phenobarbital
- Lorazepam, ,Midazolam, or Diazepam

Rapid sequence intubation

- Succinylcholine
- Vecuronium
- Rocuronium
- Etomidate

Other

- Dextrose include: 50% in water (D50) and 25%in water (D25)
- Sodium Bicarbonate (8.4% & 4.2%)
- Glucagon
- Naloxone hydrochloride
- Prostaglandin E – (for ALS neonatal transports)
- Calcium chloride
- Furosemide
- 3% Sodium Chloride or Hypertonic Saline)
- Mannitol

g. IV fluids

1. Dextrose 5% 0.45 Normal Saline (D5 ½ NS)
2. Dextrose 10% in Water (D10W)
3. Normal Saline 0.9 (NS)

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